

hp OpenView Storage Mirroring

High Availability for Exchange Server 2000 and 2003

Product Version: 4.3.3

Third Edition (May 2004)

Part Number: T2557–90005

This document summarizes the steps necessary to configure Storage Mirroring version 4.3.3 to provide high availability for Windows 2000/2003 servers running Microsoft Exchange Server versions 2000 or 2003.

For the latest version of these Application Notes and other Storage Mirroring documentation, access the HP storage web site at: http://www.hp.com/country/us/eng/prodserv/storage.html.



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Printed in USA

Storage Mirroring High Availability for Exchange Server 2000 and 2003 Application Notes Third Edition (May 2004)

Part Number: T2557-90005

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Introduction

Microsoft[®] Exchange[®] Server is a messaging and collaboration server for the most demanding business needs. Its scalability, performance, and enhanced security make Exchange an ideal messaging foundation for enterprise networks. hp OpenView Storage Mirroring provides real-time enterprise data protection and replication. hp OpenView Storage Mirroring can be used to provide high availability for your Exchange server.

This document describes the steps necessary to configure hp OpenView Storage Mirroring to provide high availability for Windows servers running Microsoft Exchange Server version 2000 or 2003. These procedures allow a secondary server to assume the identity and role of a failed Exchange server while maintaining the availability of Exchange services with minimal disruption or data loss.

Because of Exchange's server name sensitivity, the limitation of unique names on the network at one time, and Windows 200x Active Directory, high availability requires a thorough knowledge of Exchange and Active Directory. To complete these instructions, you will install Microsoft Exchange Server and hp OpenView Storage Mirroring, and configure hp OpenView Storage Mirroring for replication and failover. Due to the complexities of these applications, this document is intended for network administrators with experience installing, configuring, and maintaining network applications, including hp OpenView Storage Mirroring, Microsoft Exchange Server, and Active Directory.

Requirements

- Two servers that meet one of the following operating system requirements:
 - Microsoft Windows[®] 2000
 - Microsoft Windows 2003

NOTE:

The two servers should both be running the same operating system. Although cross-platform mirroring and replication are available, Lakeview Technology recommends that the two servers be the same platform for effective failover and failback

- Both source and target machines should be member servers. You may experience problems with failover and failback if either server is a domain controller.
- Both source and target servers should have the same logical volume configuration.
- Two licensed copies of Microsoft Exchange Server that meet the following requirements:
 - Exchange Server 2000 with Service Pack 3 or higher
 - Exchange Server 2003
- Two licensed copies of hp OpenView Storage Mirroring
- A valid user account with access and permission to add, modify, and delete objects in Active Directory

Netdom Microsoft utility - If you want to avoid rebooting during certain stages of these procedures, you can use a Microsoft utility called netdom. There are two different versions of this utility which provide slightly different capabilities, each of which need to be used during this process. Because the utilities use the same file name, the process can be confusing. If you want to use the utilities to avoid rebooting, acquire both files as outlined below, renaming the second file as instructed. The use of these utilities is optional. These utilities are not required to complete the process. They only avoid rebooting at certain times.

Netdom is included in the Windows 200x Support Tools, found in the Support directory on the Windows 200x CD. This utility allows you to add a machine into a domain but it does not allow you to add a machine into a workgroup. Copy this file onto your server leaving the file name called netdom.

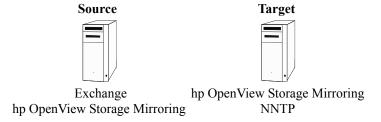
Netdom4 can be downloaded from the Microsoft FTP site at

ftp://ftp.microsoft.com/reskit/nt4/x86/netdom_x86.exe. This utility allows you to add a machine into a workgroup but does not allow you to add it to a domain. Copy this file onto your server renaming the file to netdom4.

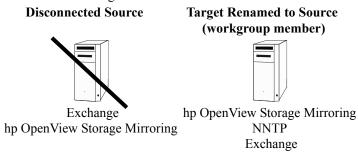
Protecting Your Exchange Data

Protecting your Exchange data is a complex process. To help you understand the entire process, each component that you need to complete is briefly described below. Note that the process includes downtime for your Exchange users so schedule this process accordingly.

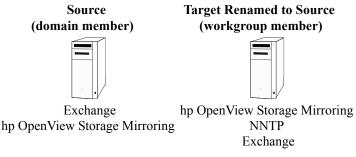
Preparing the Source and Target Servers on page 4 includes the installation and preparation instructions for both the source and target. After this section is complete, you will have the source configured with Exchange and hp OpenView Storage Mirroring and the target configured with hp OpenView Storage Mirroring and NNTP.



• Configuring the Exchange Target on page 6 steps you through configuring your target machine so that it is identical to the source. To do this, you must take the source machine, and thus Exchange, offline. Users will be unable to access Exchange until you have completed all of the steps in this section and moved on to the next section which brings the source back online.



 Bringing the Source Back Online on page 10 reconnects the source to the network allowing users to access Exchange.



- Configuring hp OpenView Storage Mirroring on page 12 creates your hp OpenView Storage Mirroring
 replication set and establishes the hp OpenView Storage Mirroring connection between your source and
 target machines.
- Configuring Failure Monitoring on page 14 establishes high availability by configuring hp OpenView Storage Mirroring failure monitoring. After this section is complete, the target can stand in for the source with minimal disruption to end users.

Preparing the Source and Target Servers

In this section you will be installing software and preparing the machines.

1. Install Exchange on your source, if it is not already installed.

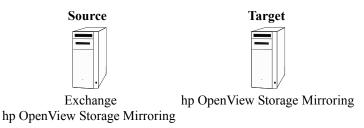


NOTE: Keep track of your installation selections and storage locations so that Exchange can be installed identically on the target.

- Apply any service packs or patches.
- 3. Install hp OpenView Storage Mirroring on the source, if it is not already installed.

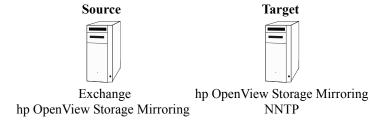


4. Install hp OpenView Storage Mirroring on the target, if it is not already installed.



- 5. Verify that the NNTP service is installed on the target. If it is not, the Exchange installation on the target will fail.
 - a. Select Start, Settings, Control Panel, Add/Remove Programs.

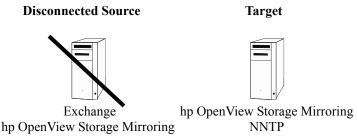
- b. Click Add/Remove Windows Components.
- c. Select Internet Information Services (IIS) and click Details.
- d. Enable NNTP and click OK.
- e. Click **Next** to complete the NNTP installation.



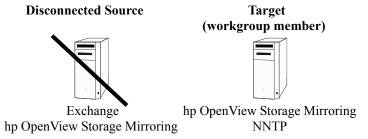
Configuring the Exchange Target

In this section you will be configuring your target machine so that it is identical to the source. To do this, you must take the source machine, and thus Exchange, offline. Users will be unable to access Exchange until you have completed all of the steps in this section and moved on to the next section which brings the source back online.

1. Temporarily, disconnect the source server from the network. This avoids conflicts when the target is configured with the source's identity.

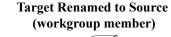


- 2. Remove the target from the domain by right-clicking My Computer and selecting Properties.
- 3. Select the Network Identification tab and click **Properties**.
- 4. Under Member of, change to Workgroup and specify a workgroup name, for example EXCHADR.
- 5. When prompted for an account, specify a user with permissions to remove a workstation from the domain. This would be local administrator rights or equivalent.
- 6. Click OK.
- 7. Click **OK** again but do not reboot when prompted.



8. Rename the target machine to the Exchange server (source machine) name and reboot.

Disconnected Source







hp OpenView Storage Mirroring

hp OpenView Storage Mirroring NNTP

NOTE:

By default NetBIOS is enabled only if DHCP is used, but if DHCP is not used, NetBIOS must be enabled over TCP/IP on the network.

Steps 9-14 add the target to the domain which requires a reboot. If you want to avoid this reboot, you can run the following two commands manually or in a script file. See Requirements on page 4 for details on the netdom and netdom4 utilities. Modify the commands to fit the names used in your environment.

netdom join source_server_name /Domain:domain_name /UserD:user_name /PasswordD:password

runas /user:domain\user "cd_drive:\setup\i386\setup.exe /DisasterRecovery"

If you choose to automate steps 9-14, continue with step 15.

- 9. Right-click My Computer and select Properties.
- 10. Select the Network Identification tab and click **Properties**.
- 11. Under Member of, change to Domain and specify the domain name.
- 12. Click OK.
- 13. When you are prompted for a domain account, specify an account with permissions to add a workstation to the domain.
- **14.** Reboot when prompted.

Disconnected Source

Target Renamed to Source (workgroup member)





hp OpenView Storage Mirroring

hp OpenView Storage Mirroring

- 15. After the target reboots, log in as the domain administrator or an equivalent account. Verify that the account has full Exchange Administrator rights.
- 16. Using the Exchange CD, start the Exchange installation on the target using the following command <cd drive>:\setup\i386\setup.exe /DisasterRecovery.
- 17. At the Component Selection dialog box, set the Action column to Disaster Recovery for all of the components that were installed on the source.
- 18. Verify that each of the components selected are installed to the same location on the target as they are on the source. If not, modify the location of each component to match the source configuration.
- 19. After selecting the proper components and locations, click Next to continue the install.
- If you accepted the default installation on the source, set Microsoft Exchange Messaging and Collaboration Services and Microsoft Exchange System Management Tools to Disaster Recovery.

NOTE:

Because the Exchange disaster recovery installation is configured for tape backup recovery, informational messages such as those below do not apply to this configuration and can be disregarded.

Please use Exchange Admin Snap-in to ensure that you have a valid Exchange Server Object for this server for which you are running setup in recovery mode.

After setup has completed, please restore your databases from backup and then reboot your machine.

21. During the post installation processing, the installation may stall while trying to start the System Attendant (MSExchangeSA) service. It should take no more than a couple of minutes to start this service. If it takes longer, use the Windows Task Manager to terminate the setup process. This will not affect your ability to start services on the target after a failure.

Disconnected Source



hp OpenView Storage Mirroring

Target Renamed to Source (workgroup member)

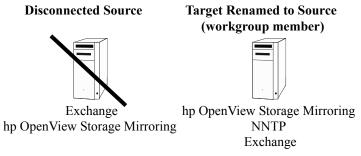


hp OpenView Storage Mirroring
NNTP

Exchange

- 22. Install any Exchange service packs or patches.
- 23. On the target, set the following services to manual startup.
 - Computer Browser (this is only required if the target is on the same network segment)
 - Distributed File System
 - File/Print for MAC (dependency of the Workstation service)
 - Microsoft Exchange Information Store (MSExchangeIS)

- Microsoft Exchange Message Transfer Agent (MSExchangeMTA)
- Microsoft Exchange Routing Engine (RESvc)
- Microsoft Exchange System Attendant (MSExchangeSA)
- Net Logon (dependency of the Workstation service)
- Server
- Workstation
- 24. Remove the target from the domain by right-clicking My Computer and selecting Properties.
- 25. Select the Network Identification tab and click **Properties**.
- 26. Under Member of, change to Workgroup and specify a workgroup name, for example EXCHADR.
- 27. When prompted for an account, specify a user with permissions to remove a workstation from the domain. This would be local administrator rights or equivalent.
- 28. Click OK.
- 29. Click **OK** again and reboot when prompted.
- 30. After the reboot, log into the target server and verify all of the services listed in step 23 have not started. Any of these services that were not set to manual should be stopped and set to manual startup before proceeding.



At this point the target is configured identically to the source. To continue the pre-failure configuration instructions, you need to redirect Active Directory to the original source and bring Exchange online.

Bringing the Source Back Online

This section brings the source back online so that the end users can access Exchange.

NOTE:

Steps 1-9 put the source into a workgroup and then move it back into the domain which requires a reboot. If you want to avoid this reboot, reconnect the source to the network and then run the following commands manually or in a script file. Nltest is included in the Windows 200x Support Tools, found in the Support directory on the Windows 200x CD. See Requirements on page 4 for details on the netdom and netdom4 utilities. Modify the commands to fit the names used in your environment. The services must be started in the order shown.

net stop RESvc /y

net stop MSExchangeSA /y

netdom4 MEMBER \\source_server_name /JOINWORKGROUP workgroup_name netdom JOIN source_server_name /Domain:domain:name /UserD:user_name

/PasswordD:password

nltest /SC_CHANGE_PWD:domain_name

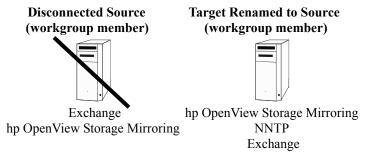
net start MSExchangeSA

net start RESvc

net start MSExchangeMTA net start MSExchangeIS

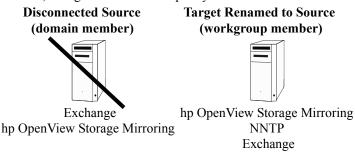
After the commands have executed, continue with step 10.

- 1. Right-click My Computer and select Properties.
- 2. Select the Network Identification tab and click **Properties**.
- 3. Under Member of, change to Workgroup and specify a workgroup name.
- Click OK.

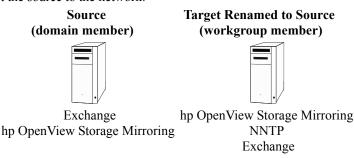


- 5. Do not reboot when prompted. This will return you to the Network Identification tab.
- 6. Click Properties again.

7. Under Member of, change to Domain and specify the domain name.



8. Reconnect the source to the network.



- Reboot the machine at this time.
- 10. Mount any data stores that are not mounted. (Open the Exchange System Manager and select Site, Servers, Source Server, Storage Groups. Right-click each store that is not mounted (those marked with a red icon) and select Mount Store.)
- 11. Configure the stores to always mount at startup. (Right-click each store and select **Properties**. On the Database tab, disable **Do not mount this store at startup** and enable **This database can be overwritten by a restore**.)

WARNING: Changes to your source machine Exchange configuration, such as an Exchange service packs, must be reflected in your target configuration. Therefore, if you make changes to your source Exchange configuration, you must repeat these last two sections so that the target's version would be identical to the source.

At this time, your Exchange is running again on your source. User access can resume. To complete the pre-failure configuration, you need to create a hp OpenView Storage Mirroring replication set, establish a connection and configure failure monitoring.

Configuring hp OpenView Storage Mirroring

In this section, you will be creating your hp OpenView Storage Mirroring replication set and establishing the hp OpenView Storage Mirroring connection between your source and target machines.

- 1. On the source, open the hp OpenView Storage Mirroring Management Console (Start, Programs, hp OpenView Storage Mirroring, Management Console).
- 2. Select File, Options and on the Configuration tab, disable Heartbeat Advertisement and click OK.
- 3. If the source server appears in the hp OpenView Storage Mirroring world view tree (left pane of the Management Console), remove it by right-clicking on it and selecting **Remove**.
- 4. Reinsert the source by the IP address. Select Insert, Server, enter the IP address and click OK.
- 5. Double-click on the source to login.
- **6.** Right-click on the source and select **Properties**.
- 7. On the Source tab, enable Block Checksum All Files on a Difference Mirror and click OK.
- 8. Right-click the source and select New, Replication Set and enter the desired name for the replication set.
- 9. Select all of your Exchange data, excluding the \bin directory.

NOTE: Be sure of the following caveats:

- Select all of the Exchange directories.
- Exclude the \bin directory.
- Exclude any application files (.dll and .exe) since Exchange is already installed on the target.
- 10. Right-click the replication set name and select Save to save the replication set.
- 11. Leave the Management Console open and also open the Text Client (Start, Programs, hp OpenView Storage Mirroring, Text Client).
- 12. Login into the source using the login command. Make sure that you are using an account that is a member of the hp OpenView Storage Mirroring Admin security group.
 - login source_IP_address user_name password domain_name
- 13. Login into the target using the login command. Make sure that you are using an account that is a member of the hp OpenView Storage Mirroring Admin security group.
 - login target IP address user name password
- **14.** Identify the source as the active source machine by using the source command.
 - source source IP address
- 15. Connect the replication set that you created through the Management Console to the target by using the connect command.
 - connect replication set name to target IP address map exact

16. After the connection has been established, close the Text Client. You can monitor the connection through the Management Console.

NOTE: Exchange continuously writes data to the disk causing the replication statistics in the hp OpenView Storage Mirroring Management Console to constantly change, even when users are not logged in. For disaster recovery purposes, your data is protected after the mirror is complete and the Mirror Status has changed to Idle. Orphan files can be removed from the target using the orphan DTCL commands. For

complete details, see *Appendix - Configuring Orphan Files* on page 24.

Configuring Failure Monitoring

You will be establishing high availability by configuring hp OpenView Storage Mirroring failure monitoring. In the event of a failure, the target can stand in for the source with minimal disruption to end users.

If a failure occurs, you will want to have the Exchange services start on the target machine
automatically. To do this, create a batch file on the target called postover.bat using the sample batch file
below. Save the batch file to the same directory where your hp OpenView Storage Mirroring files are
installed

PostOver.BAT

```
rem Sample post-failover script for Exchange 2000/2003.
rem The following lines start the necessary operating system services on the target.
net start lanmanworkstation
net start lanmanserver
net start browser
net start DFS
rem The following line joins the domain. A copy of the netdom.exe utility should be located in
rem directory as the script file. See Requirements on page 1 for details on the netdom and netdom4
utilities.
netdom join source_server_name /Domain:domain_name /UserD:user_name /PasswordD:password
rem The following line ensures that the Exchange System Attendant service logs in successfully.
A copy of the
rem nltest.exe utility should be located in the same directory as the script file.
nltest /SC CHANGE PWD:domain name
rem The following lines start the Exchange services on the target. You may need to modify the
script to fit the
rem Exchange version and specific services used in your environment, although the services must
be started in
rem the order shown.
net start MSExchangeSA
net start MSExchangeIS
net start MSExchangeMTA
net start MSExchangeMGMT
net start RESvc
     If you are not going to failover the IP address of the source to the target (because of a WAN
      environment), you must make additional DNS updates. Since this script is run by the hp
OpenView Storage Mirroring for
      Windows service on the target, the login account running the hp OpenView Storage Mirroring
service must have sufficient
    privileges to update DNS. If secure updates only is enabled on the DNS server, the account
rem hp OpenView Storage Mirroring service must be in the domain's DnsAdmins group. The dnscmd.exe
utility used in this
      script is included in the Windows 200x Support Tools, found on the Windows 200x CD in the
rem
\Support
      directory. If you are not going to failover the IP address of the source, remove the rem
rem
comment from rem
                  the lines below and modify the commands to fit your environment.
rem dnscmd dns_server_name /RecordDelete domain_name source_name A source_IP_address /f
      In the following line and the fourth line below the subnet is identical to what appears on
the PTR record's
      properties in the Windows 200x DNS utility
rem
rem dnscmd dns_server_name /RecordDelete subnet.in-addr.arpa 2 PTR
rem source_server_name /f
rem dnscmd dns_server_name /RecordAdd domain_name source_server_name A target_IP_address
rem dnscmd dns_server_name /RecordAdd subnet.in-addr.arpa 4 PTR
rem source_server_name
```

2. After a failure is resolved, you will be ready to bring your source back online. At this time, you will want to stop the Exchange services on the target automatically. To do this, create a batch file on the target called preback bat using the sample batch file below. Save the batch file to the same directory where your hp OpenView Storage Mirroring files are installed.

PreBack.BAT

```
rem Sample pre-failback script for Exchange 2000/2003.
rem The following lines stop the Exchange services on the target. You may need to modify the
script to fit the
rem Exchange version and specific services used in your environment, although the services must
be stopped in
rem the order shown.
net stop MSExchangeIS /v
net stop RESvc /y
net stop MSExchangeMTA /y
net stop MSExchangeSA /y
net stop MSExchangeMGMT /y
rem You need to remove the target server from the domain and assign it to a workgroup. See
rem Requirements on page 1 for details on the netdom and netdom4 utilities.
netdom4 MEMBER \\target server name /JOINWORKGROUP workgroup name
rem The following lines stop the necessary operating system services on the target.
net stop browser /y
net stop DFS /y
net stop lanmanserver /y
net stop lanmanworkstation /y
rem The following commands reverse the changes made to DNS upon failover. These commands are only
    necessary if you did not failover the source IP address (because of a WAN environment).
rem dnscmd dns_server_name /RecordDelete domain_name source_server_name A target_IP_address /f
      In the following line and the fourth line below the subnet is identical to what appears on
rem
the PTR record's
      properties in the Windows 200x DNS utility
rem dnscmd dns_server_name /RecordDelete subnet.in-addr.arpa 4 PTR source_server_name
rem /f
rem dnscmd dns_server_name /RecordAdd domain_name source_server_name A source_IP_address
rem dnscmd dns_server_name /RecordAdd subnet.in-addr.arpa 2 PTR
rem source_server_name
```

3. To bring the source online after failback occurs so that Active Directory can locate it, create a post-failback source script on the source. To do this, create a batch file on the source called postback source.bat using the sample batch file below. Save the batch file to the same directory where your hp OpenView Storage Mirroring files are installed on the source.

PostBack Source.BAT

```
rem Sample post-failback source script for Exchange 2000/2003.

rem You need to remove the target server from the domain and assign it to a workgroup. See rem Requirements on page 1 for details on the netdom and netdom4 utilities. netdom4 MEMBER \\source_server_name /JOINWORKGROUP workgroup_name rem The following lines stop the Exchange services on the source. You may need to modify the script to fit the rem Exchange version and specific services used in your environment although the services must be stopped in rem the order shown.

net stop RESvc /y
net stop MSExchangeSA /y
rem The following lines join the domain without requiring a reboot of the server.

netdom JOIN source_server_name /Domain:domain_name /UserD:user_name /PasswordD:password nltest /SC_CHANGE_PWD:domain_name
```

- 4. On the target, open the Failover Control Center (Start, Programs, hp OpenView Storage Mirroring, Failover Control Center).
- 5. The target you need will not be displayed, so click Add Target, enter the IP address, and click OK.
- 6. Click **Login** to log on to the target.
- 7. To add a monitor for the selected target, click **Add Monitor**.
- 8. Click Custom and type in the IP address and name of the source server and click OK.
- 9. In the Monitor Settings window, mark the IP address that is going to failover.
- 10. Verify that Adding Source Identity to Target is disabled under Perform Failover By.
- 11. Verify Manual Intervention is enabled.
- 12. If your source and target are on a WAN, disable IP Address(es) under Items to Failover.
- 13. Disable Failover Hostname and Failback Hostname under Active Directory.
- 14. Click Account and specify a username and password with full domain administrative privileges.
- 15. Click **OK** to go back to the Monitor Settings dialog box.
- 16. Click Scripts and specify the location and file names of the failover and failback scripts.
- 17. Click **OK** to go back to the Monitor Settings dialog box.
- **18.** Click **OK** to begin monitoring the source machine.

This completes the pre-failure configuration steps. In the event of a source machine failure, your target machine is now ready to stand in for the source.

Dealing With a Failure

If a failure occurs and the Failover Control Center Time to Fail counter reaches zero (0), a dialog box will appear in the Failover Control Center requiring user intervention to initiate failover. (If the Failover Control Center is not open when the failure occurs, the dialog box will appear the next time the Failover Control Center is opened. See the hp OpenView Storage Mirroring User's Guide for details on monitoring a failure.)

If your source and target servers are in a WAN environment, update your DNS records on the target so that the source points to the target's IP address. Otherwise, go ahead and acknowledge the manual intervention prompt to start failover.

The failover script created earlier will automatically run. During failover, Windows Event Viewer and the hp OpenView Storage Mirroring log record the failover events. When failover is complete, the target will have joined the domain, started the Exchange services, and mounted the information stores. At this time, clients can connect through Outlook or Outlook web access to receive their email. In a WAN environment, clients who were already accessing Exchange on the source at the time of the failure may have to wait until their cache is flushed and repointed to the target or you can force the flush by using ipconfig /flushdns.

Recovering After a Failure

If your source experiences a failure, such as a power, network, or disk failure, your target machine will stand in for the source while you resolve the source machine issues. During the source machine downtime, data is updated on the target machine. When your source machine is ready to come back online, the data is no longer current and must be updated with the new data on the target machine.

Failed Source

Target Standing In For Source





The recovery steps are different depending on the type of failure that occurred. If the source server has to be rebuilt, the process is much more involved than if the server is just offline due to non-disk related issues, such as network problems issues or power failure.

1. Resolve the issue(s) that caused the failure.

NOTE:

If you need to rebuild your source machine continue with step 2 below. If you do not need to rebuild your source machine and only experienced minor source issues (network or power errors), begin with step 26 below.

2. Install Windows, if necessary, giving the server a unique name and IP address.

Failed Source disconnected but repaired with unique server name and IP address



Target Standing In For Source



3. Install any Windows service packs or patches.

4. Temporarily, disconnect the target server from the network. At this time, users will no longer be able to access Exchange.

Failed Source disconnected but repaired with unique server name and IP address

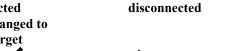






5. Change the source IP address to the target's assumed IP address. This is the source's original IP address before it failed.

Failed Source disconnected IP address changed to match target







Target Standing In For Source

6. Verify that the target is disconnected from the network and then connect the source to the network.

Failed Source IP address changed to match target

Target Standing In For Source disconnected





NOTE:

You can automate steps 7-14 and avoid rebooting by running the following two commands in a script file. See Requirements on page 4 for details on the netdom and netdom4 utilities. Modify the commands to fit the names used in your environment.

netdom join source_server_name /Domain:domain_name /UserD:user_name /PasswordD:password

 $runas \ /user:user_name \ "cd_drive:\setup\ \ i386\ setup.exe \ / Disaster Recovery"$

If you choose to automate steps 3-10, continue with step 11.

- 7. On the source, right-click My Computer and select Properties.
- 8. Select the Network Identification tab and click **Properties**.
- 9. Under Member of, change to Domain and specify the domain name.
- 10. Click OK.
- 11. When you are prompted for a domain account, specify an account with permissions to add a workstation to the domain.
- 12. Reboot when prompted.

Failed Source (domain member)

Target Standing In For Source disconnected





13. After the source reboots, log in as the domain administrator or an equivalent account. Verify that the account has full Exchange Administrator rights.

- 14. Using the Exchange CD, start the Exchange installation on the source using the following command <cd drive>:\setup\i386\setup.exe /DisasterRecovery.
- 15. At the Component Selection dialog box, set the **Action** column to **Disaster Recovery** for all of the components that were originally installed on the source (before it failed).
- 16. Verify that each of the components selected are installed to the same location on the source as they are on the target. If not, modify the location of each component to match the target configuration.
- 17. After selecting the proper components and location, click Next to continue the install.
- 18. If you accepted the default installation on the original source (before it failed), set Microsoft Exchange Messaging and Collaboration Services and Microsoft Exchange System Management Tools to Disaster Recovery.

NOTE:

Because the Exchange disaster recovery installation is configured for tape backup recovery, Informational messages such as those below do not apply to this configuration and can be disregarded.

Please use Exchange Admin Snap-in to ensure that you have a valid Exchange Server Object for this server for which you are running setup in recovery mode.

After setup has completed, please restore your databases from backup and then reboot your machine.

19. During the post installation processing, the installation may stall while trying to start the System Attendant (MSExchangeSA) service. It should take no more than a couple of minutes to start this service. If it takes longer, use the Windows Task Manager to terminate the setup process. This will not affect your ability to start services on the target after a failure.

Failed Source (domain member)

Target Standing In For Source disconnected





- 20. Install any Exchange service packs or patches.
- 21. Using System Manager, select the Database tab and enable This database can be overwritten by restore.
- 22. Stop all of the Exchange services so that you can overwrite the data with the newer data on the target.

23. Install hp OpenView Storage Mirroring.

Failed Source (domain member) **Target Standing In For Source** disconnected



Exchange



hp OpenView Storage Mirroring

24. Remove the rebuilt source from the network.

Failed Source (domain member) disconnected

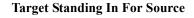
Target Standing In For Source disconnected



hp OpenView Storage Mirroring

25. Reconnect the target to the network.

Failed Source (domain member) disconnected





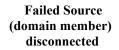




hp OpenView Storage Mirroring

- 26. On the target, open the Failover Control Center (Start, Programs, hp OpenView Storage Mirroring, Failover Control Center), if it isn't already open.
- 27. Select the target machine that is currently standing in for the failed source.

28. Highlight the failed source and click Failback. The pre-failback script stops the Exchange services on the target so that no additional changes can be made on the target. The post-failback source script will redirect Active Directory, in the event you did not rebuild your entire machine.



Target (reverted back to original configuration by failback)





hp OpenView Storage Mirroring

- 29. When prompted to continue monitoring the source server, click **Stop**.
- **30.** Connect the source to the network.

Failed Source (functional and connected

Target (reverted back to original configuration by failback)





hp OpenView Storage Mirroring

- 31. Open the Text Client (Start, Programs, hp OpenView Storage Mirroring, Text Client).
- 32. Login into the source using the login command. Make sure that you are using an account that is a member of the hp OpenView Storage Mirroring Admin security group.

login source IP address user name password domain name

33. Login into the target using the login command. Make sure that you are using an account that is a member of the hp OpenView Storage Mirroring Admin security group.

login target IP address user_name password

34. Identify the source as the active source machine by using the source command.

source source IP address

35. Disconnect the existing connection, which is in the Restore Required state by using the disconnect command with the connection ID of that connection.

disconnect con ID

- **36.** Restore the data from the target back to the source using the restore command and the options specified below. Make sure that you use the target IP address and the source name.
 - restore repset_name from target_IP_address original source_name overwrite, overwritenewer, checksum, orphans
- 37. The restoration procedure time will vary depending on the amount of data that you have to restore.
- **38.** Update any DNS or WINS records, if necessary.
- **39.** After the restoration is complete, start the Exchange services on the source machine or reboot if the nltest.exe utility was not used.

At this time, clients can connect through Outlook or Outlook web access to receive their email. In a WAN environment, clients who were accessing Exchange on the target at the time of failback may have to wait until their cache is flushed and repointed to the source or you can force the flush by using ipconfig /flushdns.

To reestablish protection of the Exchange data on the source, create a replication set, connect it to the source, restart the target hp OpenView Storage Mirroring service, and the begin failure monitoring as documented earlier in the procedure.

Appendix - Configuring Orphan Files

For complete details on the commands used in this appendix, see the hp OpenView Storage Mirroring User's Guide.

- 1. To determine the current orphan files setting, use the get command with the MoveOrphanedFiles option. By default, orphan files are moved.
- 2. To modify the orphan files setting, use the set command with the MoveOrphanedFiles option. The MoveOrphanedFiles option is set to 0 to delete orphan files or 1 to move orphan files.
- 3. You can also delete or move only those orphan files that are older than a specified time. To determine the current remove orphans time, use the get command with the RemoveOrphansTime option.
- 4. To modify the length of time applied to determine which orphan files are deleted or moved, use the set command with the RemoveOrphansTime option. This option accepts any valid number of minutes between 1 and 131072. By default, the length of time is 60 minutes.
- 5. If you are moving the orphan files, these files are relocated to another directory. To determine the location where the orphaned files are moved, use the get command with the MoveOrphansDir option.
- 6. To modify the location of renamed orphan files, use the set command with the MoveOrphansDir option. This option accepts any valid volume and directory. By default, the directory is the same drive where hp OpenView Storage Mirroring is running in a directory called \RemoveOrphans. If you are moving files, make sure the directory you specify to move the files to is not included in the destination of the replication set data so that the orphan files are only moved once.
- 7. If you want to log the orphaned files to the hp OpenView Storage Mirroring log on the target, use the get command with the LogAllOrphans option.
- 8. To modify whether or not the orphaned files are logged to the hp OpenView Storage Mirroring log on the target, use the set command with the LogAllOrphans option. This option is set to 0 to not log the files or 1 to log the files.
- 9. Orphan files will be removed or renamed, depending on your settings, when a mirror, verify, or restore is performed. If you want to remove orphan files manually, use the orphans start command.
 - orphans start connection ID
- 10. If you want to stop removing orphan files after it has been started, use the orphans stop command. orphans stop connection_ID